NATA LIGHTING CO.,LTD.
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Tel:+86-750-3770000 Fax:+86-750-3771111
Address:380JinOu Road,GaoXin Zone,Jiang Men City,Guangdong,China

## Nata

LumCAT: 3-1701-N
Luminaire: 92.70.045.00+92.70.061.00

| | |
|---|---|
| Report No: NATA0100 | Voltage(V): 33.5000 |
| Test No: GC2018070225 | Current(A): 0.5000 |
| LampCAT: NICHIA NFCWJ120B-V3 | Power (W): 16.7500 |
| Lamp flux(lm): 2276.0 | PF: 0.0000 |
| Number of Lamps: 1 | Ballast type: DC |
| Length(mm): 86 | Width(mm): 86 |
| Phm Type: C | Height(mm): 0 |

## Photometric Results

Lumens(lm): 1822.50
Efficiency(%): 80.07%
Lumens(lm)/Power(W): 109.41
Central intensity(cd): 10832.350
Maximum intensity(cd): 10832.350
Angle of maximum intensity: C=0.0 γ=0.0
Beam Angle(50%Imax): [C0/180]Total=18.4
[C90/270]Total=18.4
Field angle(10%Imax): [C0/180]Total=34.6
[C90/270]Total=34.6
Maximum s/h(1/2): C0_180=0.32 C90_270=0.32
Maximum s/h(1/4): C0_180=0.30 C90_270=0.30
Up flux rate of lamp(%): 0.00%
Down flux rate of lamp(%): 80.52%
Up flux rate of LUM(%): - -
Down flux rate of LUM(%): 100.00%
CIE Type : Direct lighting
Output flux ratio in π solid angle : 97.210%

## Zonal flux distribution table



| γ(°) | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|---|---|---|---|---|---|
| 0.0 | 10832.347 | 10.366 | 10.366 | .455% | .569% |
| 2.0 | 10583.079 | 81.002 | 91.368 | 3.559% | 5.013% |
| 4.0 | 9749.250 | 149.149 | 240.517 | 6.553% | 13.197% |
| 6.0 | 8325.009 | 190.847 | 431.364 | 8.385% | 23.669% |
| 8.0 | 6574.904 | 200.683 | 632.047 | 8.817% | 34.680% |
| 10.0 | 4640.222 | 176.715 | 808.762 | 7.764% | 44.376% |
| 12.0 | 2946.825 | 134.369 | 943.131 | 5.904% | 51.749% |
| 14.0 | 1738.131 | 92.219 | 1035.35 | 4.052% | 56.809% |
| 16.0 | 1227.620 | 74.211 | 1109.561 | 3.261% | 60.881% |
| 18.0 | 1001.586 | 67.879 | 1177.44 | 2.982% | 64.606% |
| 20.0 | 853.477 | 64.019 | 1241.459 | 2.813% | 68.118% |
| 22.0 | 730.096 | 59.982 | 1301.441 | 2.635% | 71.410% |
| 24.0 | 620.960 | 55.391 | 1356.833 | 2.434% | 74.449% |
| 26.0 | 525.947 | 50.565 | 1407.397 | 2.222% | 77.223% |
| 28.0 | 449.267 | 46.257 | 1453.655 | 2.032% | 79.761% |
| 30.0 | 387.191 | 42.458 | 1496.113 | 1.865% | 82.091% |
| 32.0 | 331.495 | 38.526 | 1534.639 | 1.693% | 84.205% |
| 34.0 | 288.798 | 35.418 | 1570.056 | 1.556% | 86.148% |
| 36.0 | 250.163 | 32.248 | 1602.305 | 1.417% | 87.918% |
| 38.0 | 217.899 | 29.421 | 1631.726 | 1.293% | 89.532% |
| 40.0 | 189.855 | 26.764 | 1658.49 | 1.176% | 91.001% |
| 42.0 | 162.478 | 23.844 | 1682.334 | 1.048% | 92.309% |
| 44.0 | 133.209 | 20.294 | 1702.628 | .892% | 93.423% |
| 46.0 | 107.346 | 16.935 | 1719.563 | .744% | 94.352% |
| 48.0 | 87.918 | 14.329 | 1733.892 | .630% | 95.138% |
| 50.0 | 71.828 | 12.067 | 1745.959 | .530% | 95.800% |
| 52.0 | 58.745 | 10.152 | 1756.112 | .446% | 96.357% |
| 54.0 | 46.247 | 8.206 | 1764.317 | .361% | 96.807% |
| 56.0 | 37.142 | 6.753 | 1771.071 | .297% | 97.178% |
| 58.0 | 30.267 | 5.629 | 1776.7 | .247% | 97.487% |
| 60.0 | 25.106 | 4.768 | 1781.468 | .210% | 97.749% |
| 62.0 | 21.417 | 4.147 | 1785.615 | .182% | 97.976% |
| 64.0 | 19.318 | 3.808 | 1789.423 | .167% | 98.185% |
| 66.0 | 18.017 | 3.610 | 1793.033 | .159% | 98.383% |
| 68.0 | 16.813 | 3.419 | 1796.452 | .150% | 98.571% |
| 70.0 | 15.753 | 3.246 | 1799.698 | .143% | 98.749% |
| 72.0 | 14.776 | 3.082 | 1802.78 | .135% | 98.918% |
| 74.0 | 14.012 | 2.954 | 1805.734 | .130% | 99.080% |

## Zonal flux distribution table



| γ(°) | Average I(cd) | Zonal F(lm) | Sum F(lm) | Eff Flux(%) | Eff Sum(%) |
|---|---|---|---|---|---|
| 76.0 | 13.289 | 2.828 | 1808.562 | .124% | 99.235% |
| 78.0 | 12.505 | 2.683 | 1811.245 | .118% | 99.382% |
| 80.0 | 11.548 | 2.494 | 1813.739 | .110% | 99.519% |
| 82.0 | 10.523 | 2.285 | 1816.024 | .100% | 99.645% |
| 84.0 | 9.532 | 2.079 | 1818.103 | .091% | 99.759% |
| 86.0 | 8.548 | 1.870 | 1819.973 | .082% | 99.861% |
| 88.0 | 7.797 | 1.709 | 1821.682 | .075% | 99.955% |
| 90.0 | 7.474 | 0.820 | 1822.502 | .036% | 100.000% |

## Zonal flux distribution table



ZONAL LUMEN SUMMARY

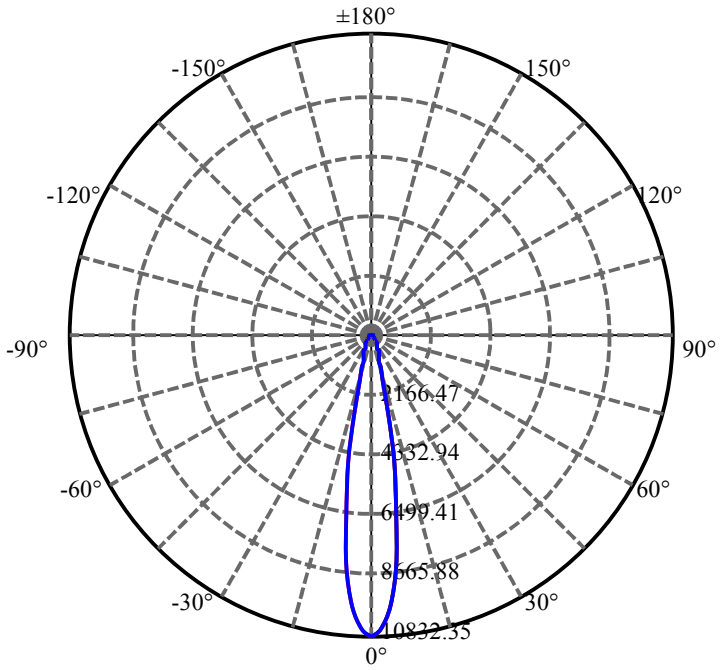
| Zone | Lumens | %Lamp | %Fixt |
|---|---|---|---|
| 0-30 | 1496.11 | 65.73% | 82.09% |
| 0-40 | 1658.49 | 72.87% | 91.00% |
| 0-60 | 1781.47 | 78.27% | 97.75% |
| 0-90 | 1821.68 | 80.04% | 99.96% |
| 0-120 | 1821.68 | 80.04% | 99.96% |
| 0-180 | 1822.50 | 80.07% | 100.00% |
| 60-90 | 44.98 | 1.98% | 2.47% |
| 90-120 | 0.00 | 0.00% | 0.00% |
| 90-130 | 0.00 | 0.00% | 0.00% |
| 90-150 | 0.00 | 0.00% | 0.00% |
| 90-180 | 0.00 | 0.00% | 0.00% |
| 0-28.20 | 1458.00 | 64.06% | 80.00% |

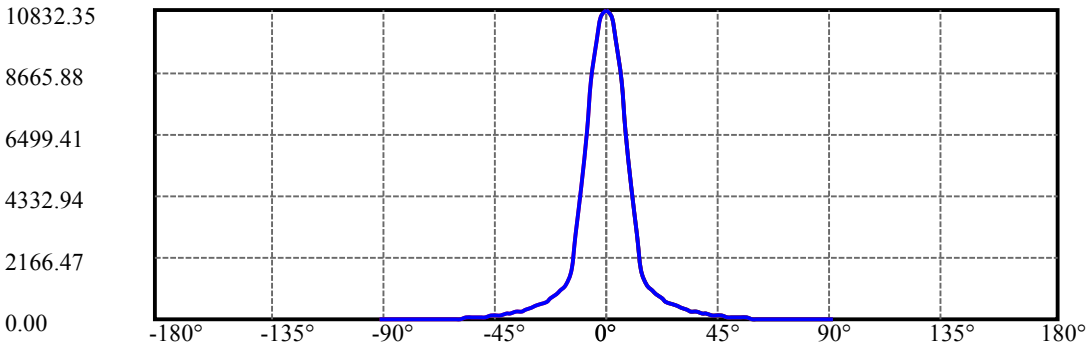
ZONAL LUMEN SUMMARY

| | |
|---|---|
| 0-10 | 808.76 |
| 10-20 | 432.70 |
| 20-30 | 254.65 |
| 30-40 | 162.38 |
| 40-50 | 87.47 |
| 50-60 | 35.51 |
| 60-70 | 18.23 |
| 70-80 | 14.04 |
| 80-90 | 7.94 |
| 90-100 | 0.00 |
| 100-110 | 0.00 |
| 110-120 | 0.00 |
| 120-130 | 0.00 |
| 130-140 | 0.00 |
| 140-150 | 0.00 |
| 150-160 | 0.00 |
| 160-170 | 0.00 |
| 170-180 | 0.00 |

Light Distribution Curve [Unit:cd]






C0(Max):

C0/C180:

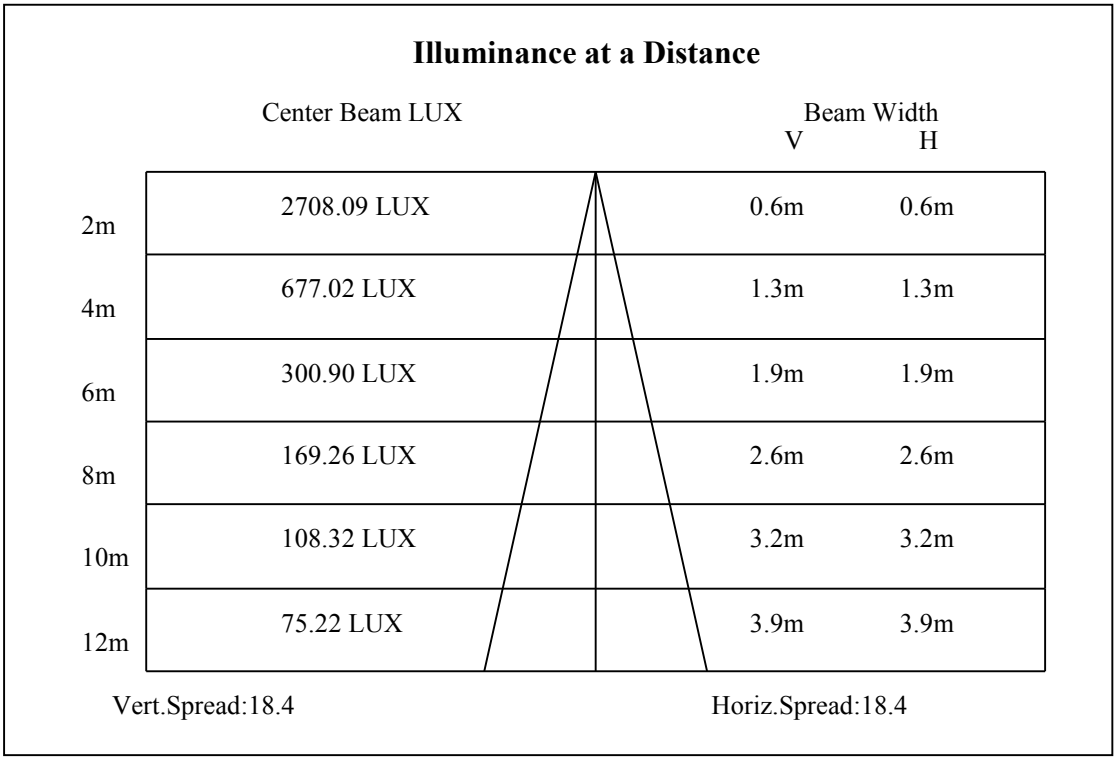
C90/C270:

Field angle(10%Imax):C0/180Left:17.3 Right:17.3
:C90/270Left:17.3 Right:17.3

Beam Angle(50%Imax):C0/180Left:9.2 Right:9.2
:C90/270Left:9.2 Right:9.2

Lux distance Curve

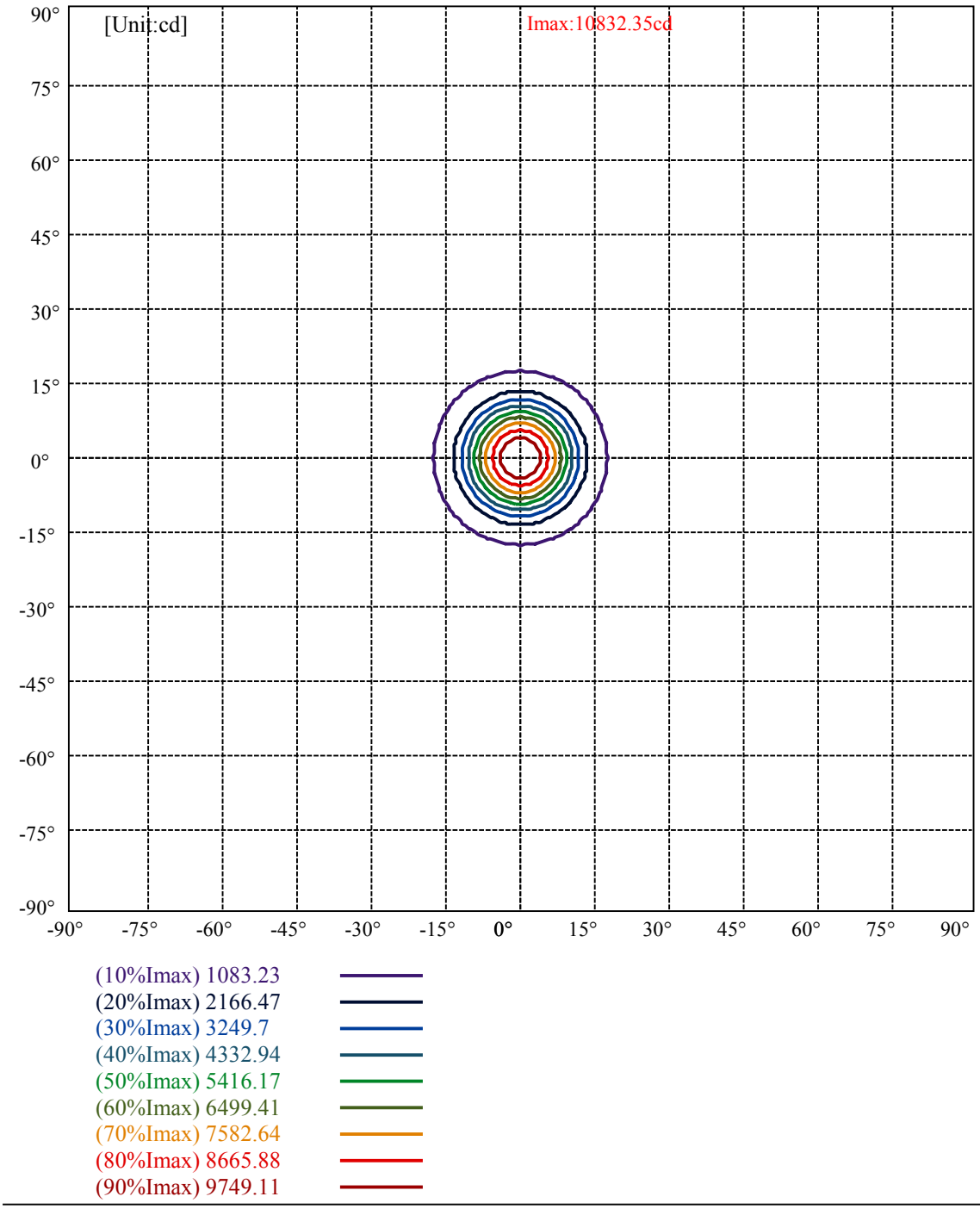





Equipment: GMS1980 Date: 2018/7/2 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 60.0% Distance(m): 7.42

ISO-Intensity(V-H)






(10%Imax) 1083.23
(20%Imax) 2166.47
(30%Imax) 3249.7
(40%Imax) 4332.94
(50%Imax) 5416.17
(60%Imax) 6499.41
(70%Imax) 7582.64
(80%Imax) 8665.88
(90%Imax) 9749.11

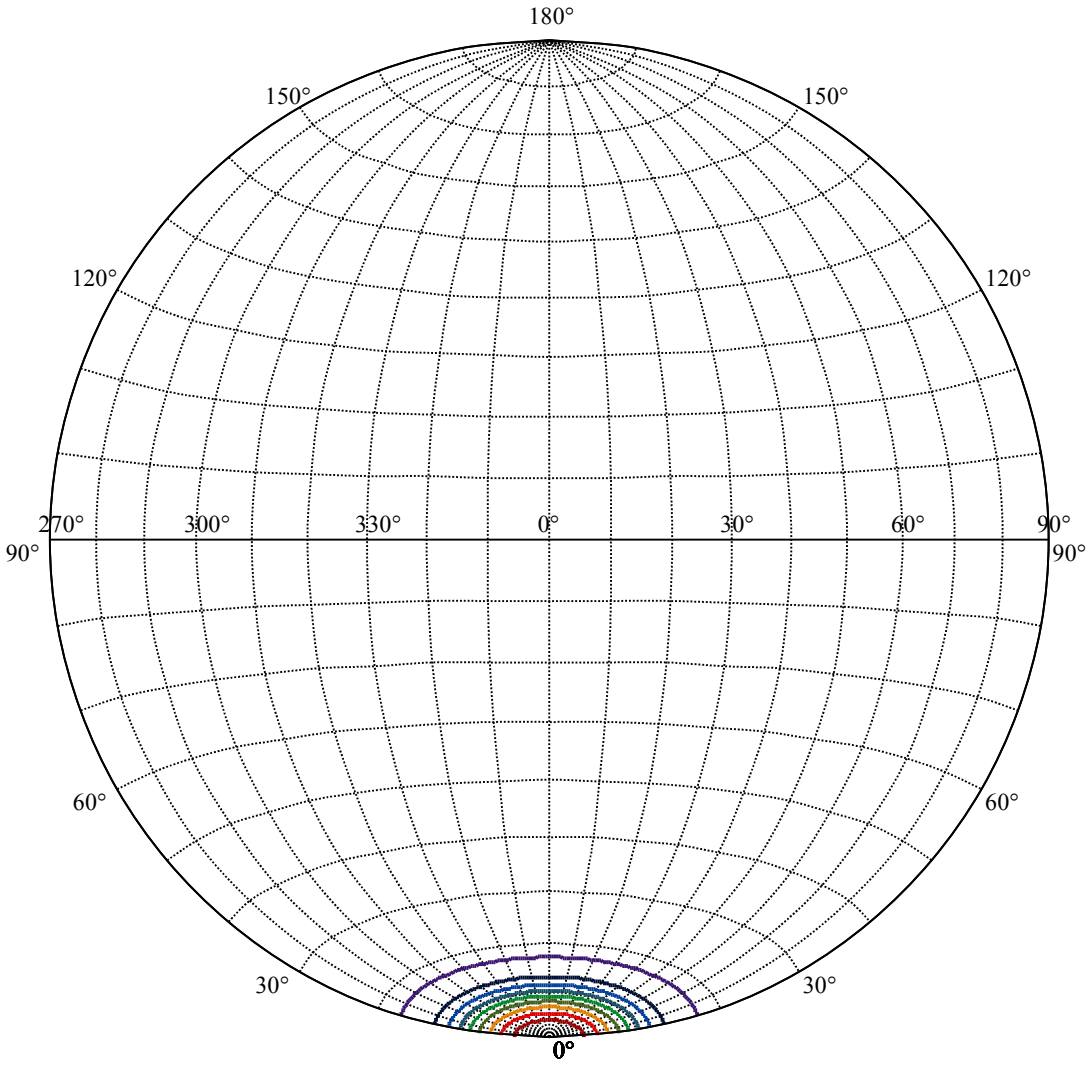
Equipment: GMS1980
Temperature(°C): 25.0

Date: 2018/7/2
Humidity(%): 60.0%

Operator: NT07
Distance(m): 7.42

## ISO candela diagram on circular web






House [Unit:cd] Road

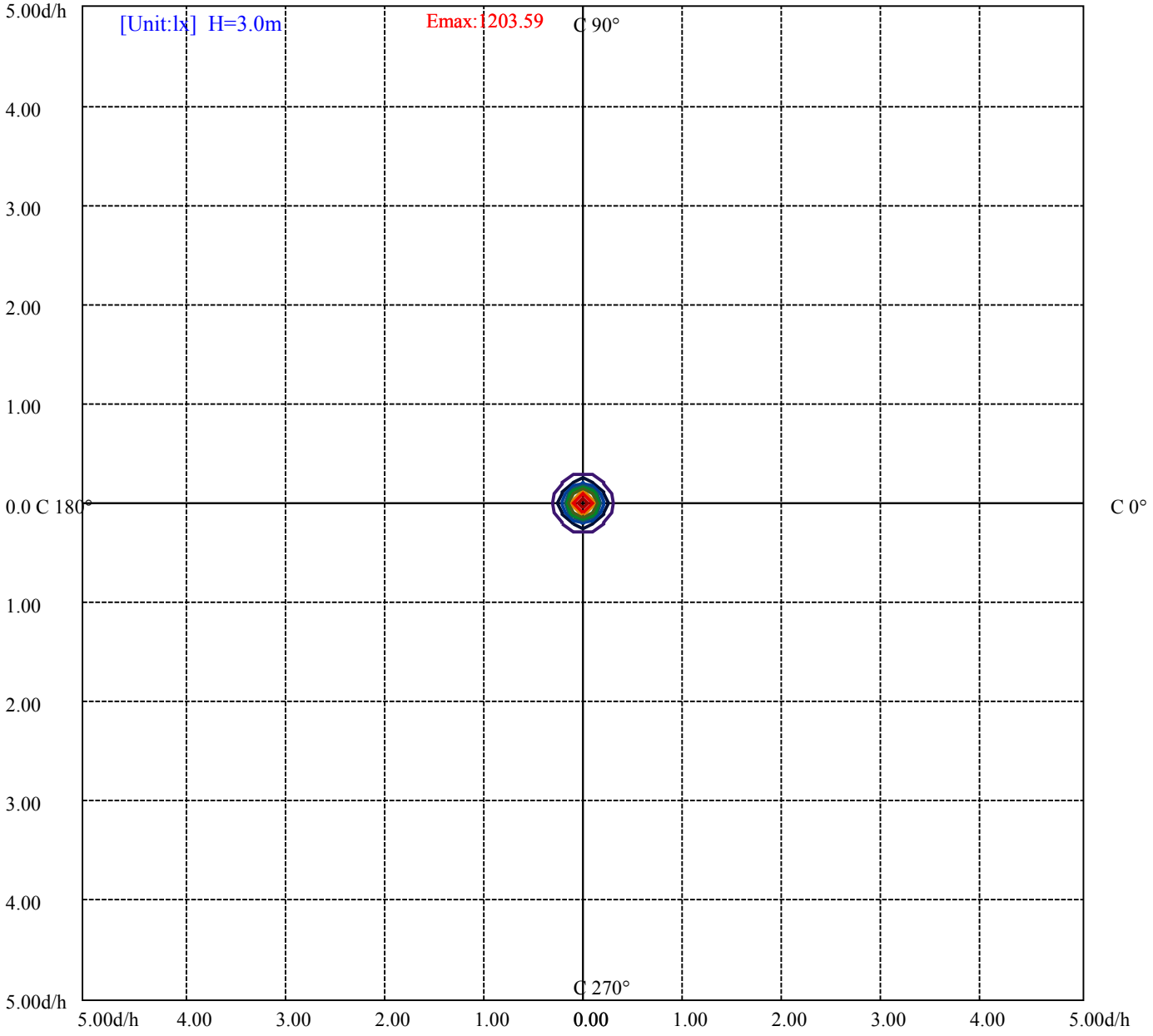
Imax:10832.35

(10%Imax) 1083.23
(20%Imax) 2166.47
(30%Imax) 3249.7
(40%Imax) 4332.94
(50%Imax) 5416.17
(60%Imax) 6499.41
(70%Imax) 7582.64
(80%Imax) 8665.88
(90%Imax) 9749.11

| | | |
|---|---|---|
| Equipment: GMS1980 | Date: 2018/7/2 | Operator: NT07 |
| Temperature(°C): 25.0 | Humidity(%): 60.0% | Distance(m): 7.42 |

## ISO illuminance diagram





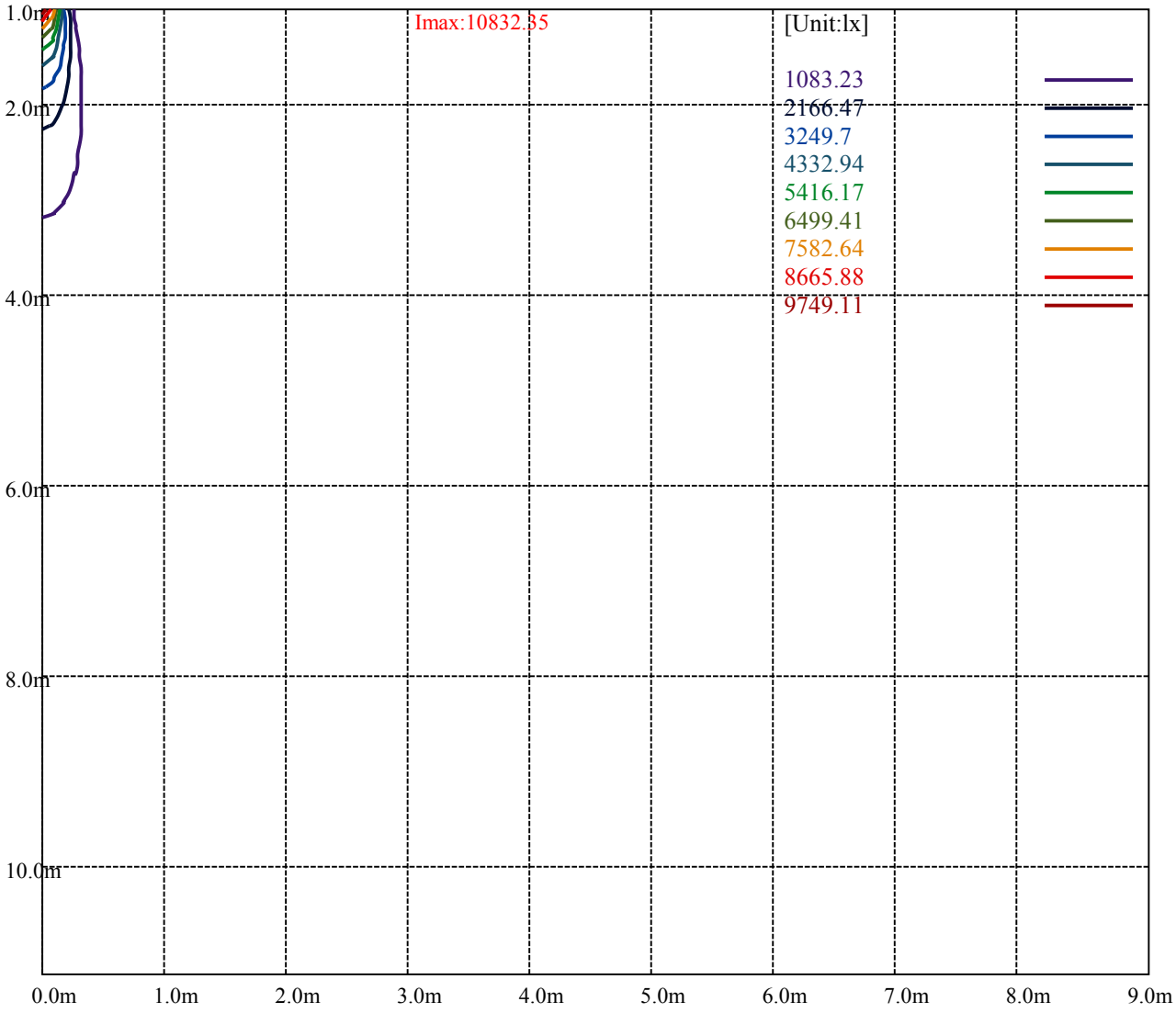

Equipment: GMS1980
Temperature(°C): 25.0

Date: 2018/7/2
Humidity(%): 60.0%

Operator: NT07
Distance(m): 7.42

## Space ISO Lux diagram






Equipment: GMS1980
Temperature(°C): 25.0

Date: 2018/7/2
Humidity(%): 60.0%

Operator: NT07
Distance(m): 7.42

## Luminance Limitting Curve(no luminous side)



Luminance Table

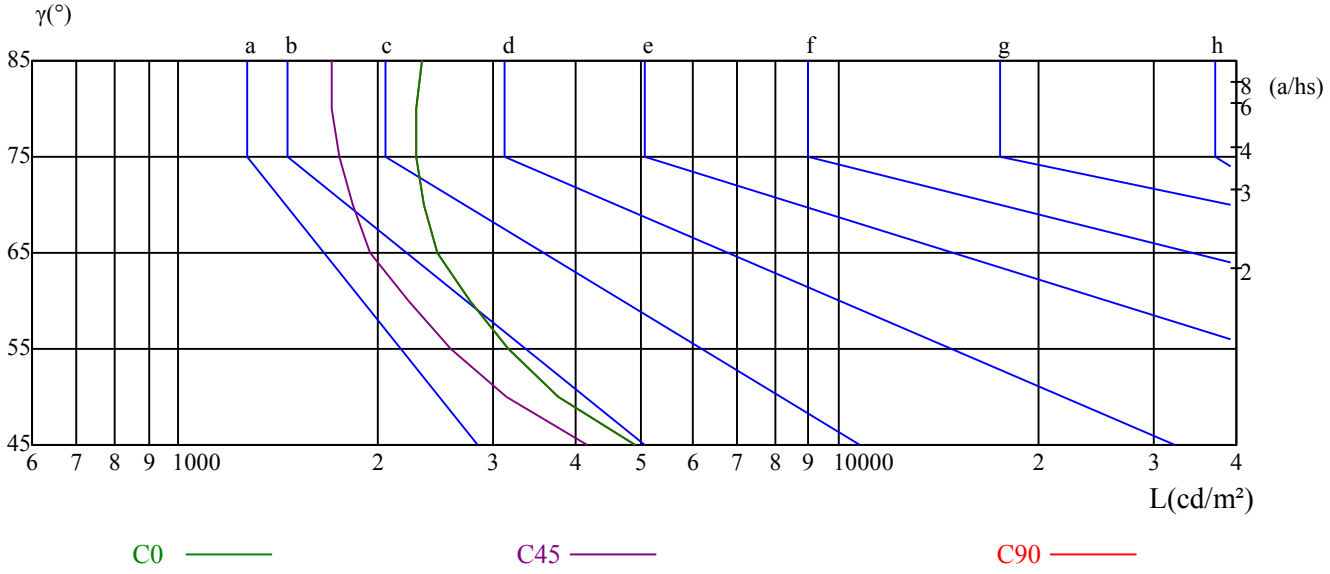
| γ | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 |
|---|---|---|---|---|---|---|---|---|---|
| C0 | 4917 | 3770 | 3151 | 2759 | 2462 | 2351 | 2291 | 2290 | 2335 |
| C45 | 4161 | 3142 | 2586 | 2228 | 1955 | 1832 | 1750 | 1711 | 1701 |
| C90 | 4917 | 3770 | 3151 | 2759 | 2462 | 2351 | 2291 | 2290 | 2335 |

| L(Hor)(65) | L(Ver)(65) | L45(65) | L(Hor)(75) | L(Ver)(75) | L45(75) | L(Hor)(85) | L(Ver)(85) | L45(85) |
|---|---|---|---|---|---|---|---|---|
| 6594 | 6594 | 6594 | 8981 | 8981 | 8981 | 23219 | 23219 | 23219 |

Glare Table

| Glare | Quality | Service Values Illuminance(lx) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1.15 | A | 2000 | 1000 | 500 | <=300 | | | | |
| 1.5 | B | | 2000 | 1000 | 500 | <=300 | | | |
| 1.85 | C | | | 2000 | 1000 | 500 | <=300 | | |
| 2.2 | D | | | | 2000 | 1000 | 500 | <=300 | |
| 2.55 | E | | | | | 2000 | 1000 | 500 | <=300 |
| | | a | b | c | d | e | f | g | h |

Luminance Limitting Curve



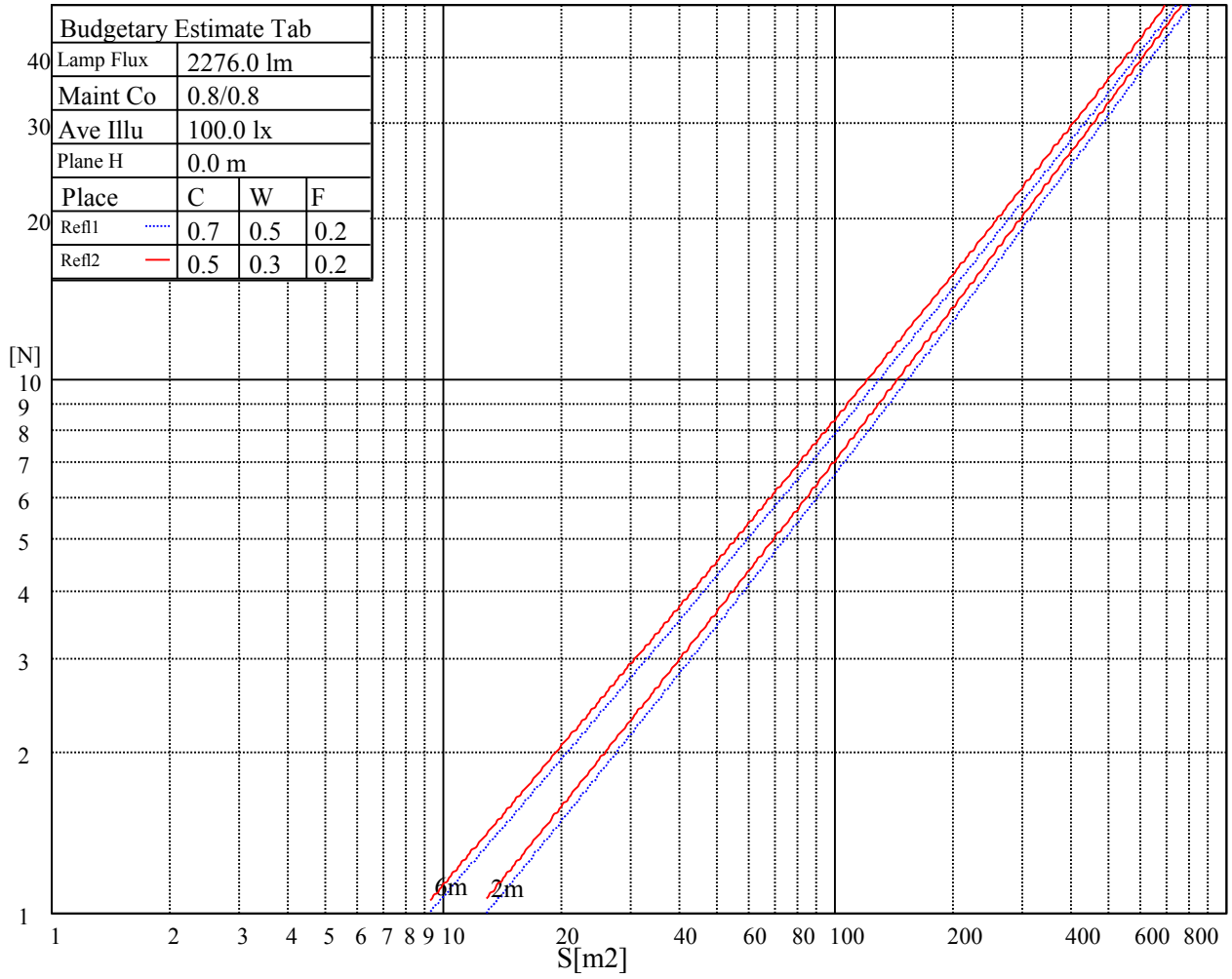

Equipment: GMS1980
Temperature(°C): 25.0

Date: 2018/7/2
Humidity(%): 60.0%

Operator: NT07
Distance(m): 7.42

## Budgetary Estimate Table






Equipment: GMS1980 Date: 2018/7/2 Operator: NT07
Temperature(°C): 25.0 Humidity(%): 60.0% Distance(m): 7.42

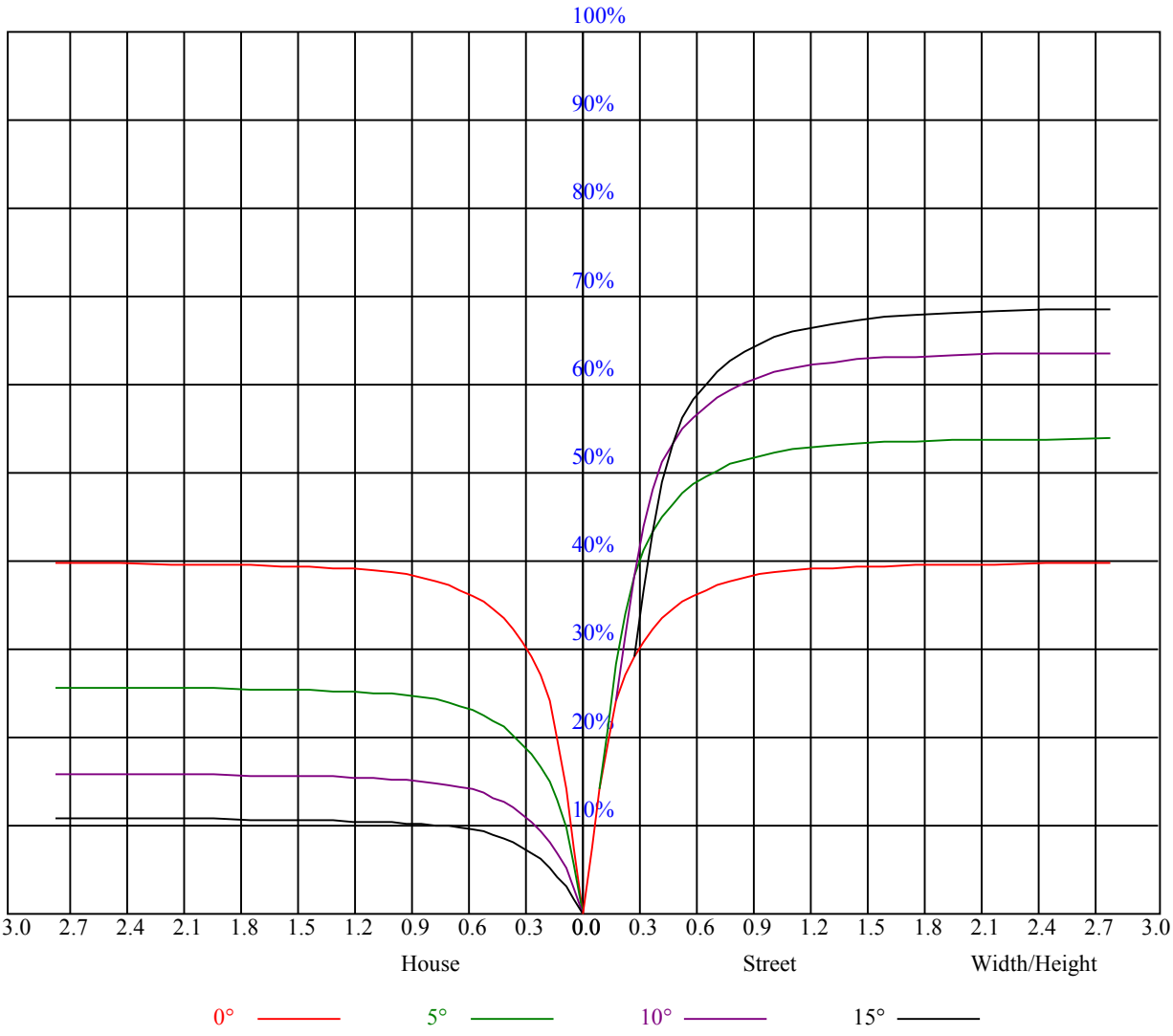
# Utilization factor table for indoor luminaire



| RHOCC | 80 | | | 70 | | | 50 | | | 30 | | | 10 | | | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RHOW | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 50 | 30 | 10 | 0 |
| RCR | COEFFCIENTS OF UTILIZATION RHOFC=20 CU | | | | | | | | | | | | | | | |
| 0 | 0.96 | 0.96 | 0.96 | 0.94 | 0.94 | 0.94 | 0.89 | 0.89 | 0.89 | 0.86 | 0.86 | 0.86 | 0.82 | 0.82 | 0.82 | 0.81 |
| 1 | 0.90 | 0.88 | 0.86 | 0.88 | 0.86 | 0.85 | 0.85 | 0.83 | 0.82 | 0.82 | 0.81 | 0.80 | 0.79 | 0.78 | 0.77 | 0.76 |
| 2 | 0.85 | 0.82 | 0.79 | 0.83 | 0.81 | 0.79 | 0.81 | 0.79 | 0.77 | 0.78 | 0.77 | 0.75 | 0.76 | 0.75 | 0.74 | 0.72 |
| 3 | 0.81 | 0.77 | 0.74 | 0.79 | 0.76 | 0.74 | 0.77 | 0.75 | 0.73 | 0.75 | 0.73 | 0.72 | 0.74 | 0.72 | 0.70 | 0.69 |
| 4 | 0.77 | 0.73 | 0.70 | 0.76 | 0.73 | 0.70 | 0.74 | 0.72 | 0.69 | 0.73 | 0.70 | 0.68 | 0.71 | 0.69 | 0.68 | 0.67 |
| 5 | 0.74 | 0.70 | 0.67 | 0.73 | 0.70 | 0.67 | 0.72 | 0.69 | 0.66 | 0.70 | 0.68 | 0.66 | 0.69 | 0.67 | 0.65 | 0.64 |
| 6 | 0.71 | 0.67 | 0.65 | 0.70 | 0.67 | 0.64 | 0.69 | 0.66 | 0.64 | 0.68 | 0.66 | 0.63 | 0.67 | 0.65 | 0.63 | 0.62 |
| 7 | 0.69 | 0.65 | 0.62 | 0.68 | 0.65 | 0.62 | 0.67 | 0.64 | 0.62 | 0.66 | 0.63 | 0.61 | 0.65 | 0.63 | 0.61 | 0.60 |
| 8 | 0.66 | 0.63 | 0.60 | 0.66 | 0.62 | 0.60 | 0.65 | 0.62 | 0.60 | 0.64 | 0.62 | 0.60 | 0.64 | 0.61 | 0.59 | 0.58 |
| 9 | 0.64 | 0.61 | 0.58 | 0.64 | 0.61 | 0.58 | 0.63 | 0.60 | 0.58 | 0.63 | 0.60 | 0.58 | 0.62 | 0.60 | 0.58 | 0.57 |
| 10 | 0.63 | 0.59 | 0.57 | 0.62 | 0.59 | 0.57 | 0.62 | 0.59 | 0.57 | 0.61 | 0.58 | 0.56 | 0.61 | 0.58 | 0.56 | 0.56 |

## Coefficient Utilization Curve






Equipment: GMS1980
Temperature(°C): 25.0

Date: 2018/7/2
Humidity(%): 60.0%

Operator: NT07
Distance(m): 7.42

Intensity data(cd)



| C/γ(°) | 0.0 | 2.0 | 4.0 | 6.0 | 8.0 | 10.0 | 12.0 | 14.0 | 16.0 |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 10860.98 | 10737.65 | 10034.58 | 8593.75 | 6774.69 | 4768.99 | 3101.33 | 1615.35 | 1112.14 |
| 45.0 | 10775.64 | 10906.67 | 10598.36 | 9535.77 | 7861.50 | 6060.06 | 3997.09 | 2231.99 | 1403.39 |
| 90.0 | 10862.08 | 10794.36 | 10234.98 | 8997.87 | 7456.84 | 5569.51 | 3613.90 | 2203.36 | 1435.32 |
| 135.0 | 10822.99 | 10744.81 | 10166.16 | 9028.15 | 7474.46 | 5650.99 | 3851.20 | 2236.94 | 1457.89 |
| 180.0 | 10876.39 | 10544.95 | 9553.39 | 8134.58 | 6283.04 | 4334.59 | 2741.26 | 1648.39 | 1242.62 |
| 225.0 | 10775.64 | 10117.71 | 8822.79 | 7042.81 | 5172.55 | 3219.15 | 1878.52 | 1302.63 | 1068.20 |
| 270.0 | 10862.08 | 10392.45 | 9257.18 | 7582.92 | 5764.96 | 3777.97 | 2280.99 | 1374.21 | 1082.41 |
| 315.0 | 10822.99 | 10426.03 | 9326.55 | 7684.22 | 5811.20 | 3740.53 | 2110.31 | 1292.17 | 1018.98 |
| 360.0 | 10860.98 | 10737.65 | 10034.58 | 8593.75 | 6774.69 | 4768.99 | 3101.33 | 1615.35 | 1112.14 |

| C/γ(°) | 18.0 | 20.0 | 22.0 | 24.0 | 26.0 | 28.0 | 30.0 | 32.0 | 34.0 |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 951.93 | 808.78 | 701.42 | 597.91 | 499.36 | 423.38 | 369.43 | 316.57 | 279.14 |
| 45.0 | 1090.12 | 911.18 | 791.16 | 665.08 | 557.72 | 472.38 | 400.26 | 339.70 | 291.80 |
| 90.0 | 1091.27 | 930.12 | 787.31 | 672.13 | 570.99 | 490.28 | 419.14 | 361.00 | 312.78 |
| 135.0 | 1163.34 | 965.14 | 830.25 | 706.92 | 602.87 | 513.68 | 444.31 | 376.04 | 319.33 |
| 180.0 | 1025.43 | 882.72 | 755.70 | 652.53 | 556.12 | 483.29 | 420.63 | 363.10 | 315.42 |
| 225.0 | 909.75 | 791.55 | 664.64 | 561.85 | 479.05 | 411.11 | 350.82 | 304.90 | 266.80 |
| 270.0 | 910.08 | 778.50 | 667.28 | 564.33 | 481.19 | 410.72 | 360.07 | 309.42 | 279.14 |
| 315.0 | 870.77 | 759.83 | 643.00 | 546.93 | 460.27 | 389.30 | 332.87 | 281.23 | 245.99 |
| 360.0 | 951.93 | 808.78 | 701.42 | 597.91 | 499.36 | 423.38 | 369.43 | 316.57 | 279.14 |

| C/γ(°) | 36.0 | 38.0 | 40.0 | 42.0 | 44.0 | 46.0 | 48.0 | 50.0 | 52.0 |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 239.55 | 206.46 | 179.43 | 155.59 | 128.89 | 102.96 | 84.68 | 69.43 | 56.98 |
| 45.0 | 251.00 | 219.56 | 195.56 | 170.40 | 143.75 | 117.55 | 95.80 | 78.35 | 65.90 |
| 90.0 | 271.70 | 236.58 | 202.33 | 175.85 | 146.89 | 120.13 | 96.13 | 79.34 | 65.30 |
| 135.0 | 280.79 | 242.74 | 214.00 | 186.75 | 153.88 | 123.93 | 102.02 | 82.47 | 68.77 |
| 180.0 | 274.95 | 237.07 | 202.61 | 172.55 | 139.02 | 111.71 | 91.39 | 74.60 | 59.85 |
| 225.0 | 233.11 | 206.85 | 178.38 | 147.50 | 118.21 | 94.86 | 77.68 | 63.65 | 50.49 |
| 270.0 | 234.21 | 202.33 | 178.11 | 147.72 | 119.20 | 94.04 | 78.57 | 63.81 | 51.86 |
| 315.0 | 215.99 | 191.60 | 168.42 | 143.48 | 115.84 | 93.60 | 77.08 | 62.98 | 50.82 |
| 360.0 | 239.55 | 206.46 | 179.43 | 155.59 | 128.89 | 102.96 | 84.68 | 69.43 | 56.98 |

| C/γ(°) | 54.0 | 56.0 | 58.0 | 60.0 | 62.0 | 64.0 | 66.0 | 68.0 | 70.0 |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 44.93 | 36.06 | 29.73 | 24.83 | 21.14 | 19.21 | 17.95 | 16.68 | 15.58 |
| 45.0 | 52.30 | 40.96 | 33.86 | 27.80 | 23.51 | 20.43 | 18.94 | 17.67 | 16.57 |
| 90.0 | 51.64 | 41.62 | 33.09 | 27.64 | 23.18 | 20.26 | 18.88 | 17.62 | 16.46 |
| 135.0 | 53.85 | 42.61 | 34.74 | 27.97 | 23.07 | 19.99 | 18.66 | 17.34 | 16.35 |
| 180.0 | 46.69 | 37.27 | 30.01 | 24.94 | 20.81 | 19.05 | 17.84 | 16.63 | 15.42 |
| 225.0 | 39.64 | 32.54 | 26.54 | 22.02 | 19.93 | 18.55 | 17.29 | 16.24 | 15.14 |
| 270.0 | 40.52 | 33.14 | 27.36 | 22.96 | 20.04 | 18.72 | 17.51 | 16.35 | 15.47 |
| 315.0 | 40.41 | 32.92 | 26.81 | 22.68 | 19.66 | 18.33 | 17.07 | 15.97 | 15.03 |
| 360.0 | 44.93 | 36.06 | 29.73 | 24.83 | 21.14 | 19.21 | 17.95 | 16.68 | 15.58 |

| C/γ(°) | 72.0 | 74.0 | 76.0 | 78.0 | 80.0 | 82.0 | 84.0 | 86.0 | 88.0 |
|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 14.65 | 13.98 | 13.32 | 12.61 | 11.67 | 10.52 | 9.52 | 8.53 | 7.76 |
| 45.0 | 15.47 | 14.65 | 13.93 | 13.21 | 12.44 | 11.34 | 10.35 | 9.25 | 8.26 |
| 90.0 | 15.36 | 14.53 | 13.65 | 12.99 | 12.06 | 11.07 | 9.97 | 9.03 | 8.09 |
| 135.0 | 15.14 | 14.26 | 13.49 | 12.66 | 11.78 | 10.79 | 9.80 | 8.92 | 8.04 |
| 180.0 | 14.59 | 13.76 | 13.05 | 12.28 | 11.18 | 10.19 | 9.36 | 8.42 | 7.65 |
| 225.0 | 14.20 | 13.54 | 12.83 | 11.89 | 11.01 | 10.02 | 9.03 | 8.04 | 7.49 |
| 270.0 | 14.53 | 13.76 | 13.16 | 12.28 | 11.23 | 10.30 | 9.25 | 8.09 | 7.54 |
| 315.0 | 14.26 | 13.60 | 12.88 | 12.11 | 11.01 | 9.97 | 8.97 | 8.09 | 7.54 |
| 360.0 | 14.65 | 13.98 | 13.32 | 12.61 | 11.67 | 10.52 | 9.52 | 8.53 | 7.76 |

Intensity data(cd)



| C/γ(°) | 90.0 |
|---|---|
| 0.0 | 7.43 |
| 45.0 | 7.60 |
| 90.0 | 7.54 |
| 135.0 | 7.43 |
| 180.0 | 7.38 |
| 225.0 | 7.49 |
| 270.0 | 7.49 |
| 315.0 | 7.43 |
| 360.0 | 7.43 |